

DBMS LAB RECORD

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INSURANCE DATABASE:-

Consider the Insurance database given below. The primary keys are underlined and the data types are specified.

PERSON (driver-id #: String, name: String, address: String)

CAR (Regno: String, model: String, year: int)

ACCIDENT (report-number: int, date: date, location: String)

OWNS (driver-id #: String, Regno: String)

PARTICIPATED (driver-id: String, Regno: String, report-number: int, damage-amount: int)

- i. Create the above tables by properly specifying the primary keys and the foreign keys.
- ii. Enter at least five tuples for each relation.
- iii. Demonstrate how you a. Update the damage amount for the car with a specific Regno in the accident with report number 12 to 25000. b. Add a new accident to the database.
- iv. Find the total number of people who owned cars that involved in accidents in 2008.
- v. Find the number of accidents in which cars belonging to a specific model were involved.

```
mysql> create database Insurance;  
Query OK, 1 row affected (0.19 sec)
```

```
mysql> use Insurance;  
Database changed
```

```
mysql> create table Insurance.person(driver_id varchar(10),name varchar(10),address varchar(10),primary  
-> key(driver_id));  
Query OK, 0 rows affected (1.02 sec)
```

```
mysql> desc Insurance.person;
```

Field	Type	Null	Key	Default	Extra
driver_id	varchar(10)	NO	PRI	NULL	
name	varchar(10)	YES		NULL	
address	varchar(10)	YES		NULL	

```
mysql> insert into Insurance.person values('&driver_id','&name','&address');  
Query OK, 1 row affected (0.09 sec)
```

```
mysql> insert into Insurance.person values('A01','MSD','Banglore');  
Query OK, 1 row affected (0.10 sec)
```

```
mysql> insert into Insurance.person values('A02','VK','CHENNAI');
Query OK, 1 row affected (0.10 sec)
```

```
mysql> insert into Insurance.person values('A03','RS','KERALA');
Query OK, 1 row affected (0.14 sec)
```

```
mysql> insert into Insurance.person values('A04','SR','UP');
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into Insurance.person values('A05','KP','ENG');
Query OK, 1 row affected (0.09 sec)
```

```
mysql> commit;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> select * from Insurance.person;
```

```
+-----+-----+-----+
| driver_id | name | address |
+-----+-----+-----+
| &driver_id | &name | &address |
| A01      | MSD  | Bangalore |
| A02      | VK   | CHENNAI  |
| A03      | RS   | KERALA   |
| A04      | SR   | UP       |
| A05      | KP   | ENG      |
+-----+-----+-----+
```

```
mysql>
mysql> create table Insurance.car(regno varchar(10),model varchar(10),year int,primary key(regno));
Query OK, 0 rows affected (0.36 sec)
```

```
mysql> desc Insurance.car;
+-----+-----+-----+-----+-----+-----+
| Field | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| regno | varchar(10) | NO   | PRI | NULL    |      |
| model | varchar(10) | YES  |     | NULL    |      |
| year  | int         | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> insert into Insurance.car values('&reg_num','&model','1');
Query OK, 1 row affected (0.05 sec)
```

```
mysql> insert into Insurance.car values('KA031181','Lancer', 1957);
Query OK, 1 row affected (0.08 sec)
```

```
mysql> insert into Insurance.car values('KA095477','TOYOTA', 1998);
```

Query OK, 1 row affected (0.11 sec)

```
mysql> insert into Insurance.car values('KA052250','INDICA', 1990);
```

Query OK, 1 row affected (0.17 sec)

```
mysql> insert into Insurance.car values('KA053408','HONDA', 2008);
```

Query OK, 1 row affected (0.15 sec)

```
mysql> insert into Insurance.car values('KA041702','AUDI', 2005);
```

Query OK, 1 row affected (0.07 sec)

```
mysql> commit;
```

Query OK, 0 rows affected (0.00 sec)

```
mysql> select * from Insurance.car;
```

```
+-----+-----+-----+
| regno  | model | year |
+-----+-----+-----+
| &reg_num | &model | 1 |
| KA031181 | Lancer | 1957 |
| KA041702 | AUDI   | 2005 |
| KA052250 | INDICA | 1990 |
| KA053408 | HONDA  | 2008 |
| KA095477 | TOYOTA | 1998 |
+-----+-----+-----+
```

6 rows in set (0.00 sec)

```
mysql>
```

```
mysql> create table Insurance.accident(report_number int,accident_date date,location varchar(15),primary
-> key(report_number));
```

Query OK, 0 rows affected (0.38 sec)

```
mysql> desc Insurance.accident;
```

```
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| report_number | int       | NO   | PRI | NULL    |      |
| accident_date | date      | YES  |     | NULL    |      |
| location      | varchar(15) | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+-----+
```

3 rows in set (0.00 sec)

```
mysql> insert into Insurance.accident values('11', STR_TO_DATE('01-01-2003', '%m-%d-%Y'),'MysoreRoad');
```

Query OK, 1 row affected (0.07 sec)

```
mysql> insert into Insurance.accident values('12', STR_TO_DATE('02-02-2004', '%m-%d-%Y'),'Southend');
```

Query OK, 1 row affected (0.24 sec)

```
mysql> insert into Insurance.accident values('13', STR_TO_DATE('06-01-2003', '%m-%d-%Y'), 'Bulltemple');
```

Query OK, 1 row affected (0.10 sec)

```
mysql> insert into Insurance.accident values('14', STR_TO_DATE('05-02-2008', '%m-%d-%Y'), 'Mysore');
```

Query OK, 1 row affected (0.04 sec)

```
mysql> insert into Insurance.accident values('15', STR_TO_DATE('04-03-2005', '%m-%d-%Y'), 'Kanakpura');
```

Query OK, 1 row affected (0.05 sec)

```
mysql> commit;
```

Query OK, 0 rows affected (0.00 sec)

```
mysql> select * from Insurance.accident;
```

report_number	accident_date	location
11	2003-01-01	MysoreRoad
12	2004-02-02	Southend
13	2003-06-01	Bulltemple
14	2008-05-02	Mysore
15	2005-04-03	Kanakpura

5 rows in set (0.00 sec)

```
mysql>
```

```
mysql> create table Insurance.owns(driver_id varchar(10), regno varchar(10), primary
-> key(driver_id, regno), foreign key(driver_id) references person(driver_id), foreign key(regno)
-> references car(regno));
```

Query OK, 0 rows affected (0.42 sec)

```
mysql> desc Insurance.owns;
```

Field	Type	Null	Key	Default	Extra
driver_id	varchar(10)	NO	PRI	NULL	
regno	varchar(10)	NO	PRI	NULL	

2 rows in set (0.00 sec)

```
mysql> insert into Insurance.owns values ('&driver_id', '&reg_num');
```

Query OK, 1 row affected (0.10 sec)

```
mysql> insert into Insurance.owns values ('A01', 'KA052250');
```

Query OK, 1 row affected (0.31 sec)

```
mysql> insert into Insurance.owns values ('A02', 'KA053408');
```

Query OK, 1 row affected (0.11 sec)

```
mysql> insert into Insurance.owns values ('A04','KA031181');
Query OK, 1 row affected (0.04 sec)
```

```
mysql> insert into Insurance.owns values ('A03','KA095477');
Query OK, 1 row affected (0.04 sec)
```

```
mysql> insert into Insurance.owns values ('A05','KA041702');
Query OK, 1 row affected (0.04 sec)
```

```
mysql> commit;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> select * from Insurance.owns;
```

```
+-----+-----+
| driver_id | regno |
+-----+-----+
| &driver_id | &reg_num |
| A04      | KA031181 |
| A05      | KA041702 |
| A01      | KA052250 |
| A02      | KA053408 |
| A03      | KA095477 |
+-----+-----+
6 rows in set (0.00 sec)
```

```
mysql>
mysql> create table Insurance.participated(driver_id varchar(10),regno varchar(10),report_number
-> int,damage_amount int,primary key(driver_id,regno,report_number),foreign key(driver_id)
-> references person(driver_id),foreign key(regno) references car(regno),foreign key(report_number)
-> references accident(report_number));
Query OK, 0 rows affected (0.89 sec)
```

```
mysql> desc Insurance.participated;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| driver_id  | varchar(10) | NO   | PRI | NULL    |      |
| regno      | varchar(10) | NO   | PRI | NULL    |      |
| report_number | int        | NO   | PRI | NULL    |      |
| damage_amount | int        | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
mysql> insert into Insurance.participated values('A01','KA052250',11,10000);
Query OK, 1 row affected (0.05 sec)
```

```
mysql> insert into Insurance.participated values('A02','KA053408',12,50000);
Query OK, 1 row affected (0.11 sec)
```

```
mysql> insert into Insurance.participated values('A03', 'KA095477', '13', '25000');
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into Insurance.participated values('A04', 'KA031181', '14', '3000');
Query OK, 1 row affected (0.12 sec)
```

```
mysql> insert into Insurance.participated values('A05', 'KA041702', '15', '5000');
Query OK, 1 row affected (0.10 sec)
```

```
mysql> select * from Insurance.participated;
+-----+-----+-----+-----+
| driver_id | regno  | report_number | damage_amount |
+-----+-----+-----+-----+
| A01      | KA052250 | 11          | 10000         |
| A02      | KA053408 | 12          | 50000         |
| A03      | KA095477 | 13          | 25000         |
| A04      | KA031181 | 14          | 3000          |
| A05      | KA041702 | 15          | 5000          |
+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

```
mysql>
mysql> update Insurance.participated
-> set damage_amount=25000
-> where report_number=12 and regno='A02';
Query OK, 0 rows affected (0.00 sec)
Rows matched: 0 Changed: 0 Warnings: 0
```

```
mysql>
mysql> insert into Insurance.accident values('16', '2007-03-21', 'MysoreRoad');
Query OK, 1 row affected (0.08 sec)
```

```
mysql> insert into Insurance.participated values('A05', 'KA041702', '16', '5000');
Query OK, 1 row affected (0.20 sec)
```

```
mysql>
mysql> select count(distinct o.driver_id) as People from Insurance.owns o, Insurance.participated
-> p, Insurance.accident a where a.accidentd_date like
-> '2008%' and o.regno=p.regno and p.report_number=a.report_number;
```

```
mysql> use Insurance;
Database changed
mysql> select count(*) as Totalcars from car c, participated p where c.regno=p.regno and
c.model='TOYOTA';
+-----+
| Totalcars |
+-----+
| 1         |
+-----+
1 row in set (0.00 sec)
```

BANKING ENTERPRISE DATABASE

Consider the following database for a banking enterprise.

BRANCH (branch-name: String, branch-city: String, assets: real)

ACCOUNTS (accno: int, branch-name: String, balance: real)

DEPOSITOR (customer-name: String, customer-street: String, customer-city: String)

LOAN (loan-number: int, branch-name: String, amount: real)

BORROWER (customer-name: String, loan-number: int)

- i. Create the above tables by properly specifying the primary keys and the foreign keys.
- ii. Enter at least five tuples for each relation.
- iii. Find all the customers who have at least two accounts at the Main branch.
- iv. Find all the customers who have an account at all the branches located in a specific city.
- v. Demonstrate how you delete all account tuples at every branch located in a specific city.

```
mysql> create database banking;
```

```
ERROR 1007 (HY000): Can't create database 'banking'; database exists
```

```
mysql> use banking;
```

```
Database changed
```

```
mysql> create table BRANCH(branch_name varchar(20),branch_city varchar(10),assets real,primary  
-> key(branch_name));
```

```
Query OK, 0 rows affected (1.31 sec)
```

```
mysql> insert into BRANCH values('SBI_Chamrajpet','Bangalore',50000);
```

```
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into BRANCH values('SBI_Residency road','Bangalore',10000);
```

```
Query OK, 1 row affected (0.09 sec)
```

```
mysql> insert into BRANCH values('SBI_shivajiroad','Bombay',20000);
```

```
Query OK, 1 row affected (0.07 sec)
```

```
mysql> insert into BRANCH values('SBI_parliamentroad','Delhi',10000);
```

```
Query OK, 1 row affected (0.08 sec)
```

```
mysql> insert into BRANCH values('SBI_jantarmanatar','Delhi',20000);
```

```
Query OK, 1 row affected (0.05 sec)
```

```
mysql> commit;
```

```
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> select * from BRANCH;
```

```

+-----+-----+-----+
| branch_name | branch_city | assets |
+-----+-----+-----+
| SBI_Chamrajpet | Bangalore | 50000 |
| SBI_jantarantar | Delhi | 20000 |
| SBI_parlimentroad | Delhi | 10000 |
| SBI_Residency road | Bangalore | 10000 |
| SBI_shivajiroad | Bombay | 20000 |
+-----+-----+-----+
5 rows in set (0.00 sec)

```

```

mysql> create table ACCOUNTS(accno integer,branch_name varchar(20),balance real,primary
-> key(accno),foreign key(branch_name) references BRANCH(branch_name));
Query OK, 0 rows affected (0.52 sec)

```

```

mysql> insert into ACCOUNTS values('1','SBI_Chamrajpet','2000');
Query OK, 1 row affected (0.07 sec)

```

```

mysql> insert into ACCOUNTS values('2','SBI_Residency road','5000');
Query OK, 1 row affected (0.05 sec)

```

```

mysql> insert into ACCOUNTS values('3','SBI_shivajiroad','6000');
Query OK, 1 row affected (0.05 sec)

```

```

mysql> insert into ACCOUNTS values('4','SBI_parlimentroad','9000');
Query OK, 1 row affected (0.05 sec)

```

```

mysql> insert into ACCOUNTS values('5','SBI_jantarantar','8000');
Query OK, 1 row affected (0.09 sec)

```

```

mysql> insert into ACCOUNTS values('6','SBI_shivajiroad','4000');
Query OK, 1 row affected (0.21 sec)

```

```

mysql> insert into ACCOUNTS values('8','SBI_Residency road','4000');
Query OK, 1 row affected (0.17 sec)

```

```

mysql> insert into ACCOUNTS values('9','SBI_parlimentroad','3000');
Query OK, 1 row affected (0.09 sec)

```

```

mysql> insert into ACCOUNTS values('10','SBI_Residency road','5000');
Query OK, 1 row affected (0.05 sec)

```

```

mysql> insert into ACCOUNTS values('11','SBI_jantarantar','2000');
Query OK, 1 row affected (0.16 sec)

```

```

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

```

```

mysql> select * from ACCOUNTS;

```



```

+-----+-----+-----+
| accno | branch_name | balance |
+-----+-----+-----+
| 1 | SBI_Chamrajpet | 2000 |
| 2 | SBI_Residency road | 5000 |
| 3 | SBI_shivajiroad | 6000 |
| 4 | SBI_parlimentroad | 9000 |
| 5 | SBI_jantarmentar | 8000 |
| 6 | SBI_shivajiroad | 4000 |
| 8 | SBI_Residency road | 4000 |
| 9 | SBI_parlimentroad | 3000 |
| 10 | SBI_Residency road | 5000 |
| 11 | SBI_jantarmentar | 2000 |
+-----+-----+-----+
10 rows in set (0.00 sec)

```

```

mysql>
mysql> create table BANKCUST(customername varchar(20),customerstreet varchar(30),customercity
-> varchar(30),primary key(customername));
Query OK, 0 rows affected (0.59 sec)

```

```

mysql> insert into BANKCUST values('AVINASH','Bulltemple','Bangalore');
Query OK, 1 row affected (0.19 sec)

```

```

mysql> insert into BANKCUST values('dinesh','banerghata','Bangalore');
Query OK, 1 row affected (0.13 sec)

```

```

mysql> insert into BANKCUST values('mohan','mgroad','Bangalore');
Query OK, 1 row affected (0.06 sec)

```

```

mysql> insert into BANKCUST values('nikhil','churchstreet','Delhi');
Query OK, 1 row affected (0.05 sec)

```

```

mysql> insert into BANKCUST values('ravi','akbarroad','Delhi');
Query OK, 1 row affected (0.09 sec)

```

```

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

```

```

mysql> select * from BANKCUST;
+-----+-----+-----+
| customername | customerstreet | customercity |
+-----+-----+-----+
| AVINASH      | Bulltemple     | Bangalore    |
| dinesh       | banerghata     | Bangalore    |
| mohan        | mgroad         | Bangalore    |
| nikhil       | churchstreet   | Delhi        |
| ravi         | akbarroad      | Delhi        |
+-----+-----+-----+
5 rows in set (0.00 sec)

```

```

mysql> create table DEPOSIT(customername varchar(20),accno integer,primary
-> key(accno,customername),foreign key(accno) references ACCOUNTS(accno),foreign

```

-> key(customername) references BANKCUST(customername));
Query OK, 0 rows affected (0.74 sec)

mysql> insert into DEPOSIT values('AVINASH',1);
Query OK, 1 row affected (0.04 sec)

mysql> insert into DEPOSIT values('dinesh',2);
Query OK, 1 row affected (0.09 sec)

mysql> insert into DEPOSIT values('nikhil',4);
Query OK, 1 row affected (0.05 sec)

mysql> insert into DEPOSIT values('ravi',5);
Query OK, 1 row affected (0.09 sec)

mysql> insert into DEPOSIT values('AVINASH',8);
Query OK, 1 row affected (0.23 sec)

mysql> insert into DEPOSIT values('nikhil',9);
Query OK, 1 row affected (0.15 sec)

mysql> insert into DEPOSIT values('dinesh',10);
Query OK, 1 row affected (0.07 sec)

mysql> insert into DEPOSIT values('nikhil',11);
Query OK, 1 row affected (0.04 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from DEPOSIT;

```
+-----+-----+
| customername | accno |
+-----+-----+
| AVINASH      | 1     |
| AVINASH      | 8     |
| dinesh       | 2     |
| dinesh       | 10    |
| nikhil       | 4     |
| nikhil       | 9     |
| nikhil       | 11    |
| ravi         | 5     |
+-----+-----+
```

8 rows in set (0.00 sec)

mysql> CREATE TABLE LOAN(loanno int,branch_name varchar(20),amt real,primary key(loanno),foreign
-> key(branch_name) references BRANCH(branch_name));
Query OK, 0 rows affected (0.51 sec)

mysql> insert into LOAN values(1,'SBI_Chamrajpet',1000);
Query OK, 1 row affected (0.24 sec)

mysql> insert into LOAN values(2,'SBI_Residency road',2000);

Query OK, 1 row affected (0.21 sec)

```
mysql> insert into LOAN values(3,'SBI_shivajiroad',3000);
```

Query OK, 1 row affected (0.15 sec)

```
mysql> insert into LOAN values(4,'SBI_parlimentroad',4000);
```

Query OK, 1 row affected (0.04 sec)

```
mysql> insert into LOAN values(5,'SBI_jantarmentar',5000);
```

Query OK, 1 row affected (0.10 sec)

```
mysql> commit;
```

Query OK, 0 rows affected (0.00 sec)

```
mysql> select * from LOAN;
```

loanno	branch_name	amt
1	SBI_Chamrajpet	1000
2	SBI_Residency road	2000
3	SBI_shivajiroad	3000
4	SBI_parlimentroad	4000
5	SBI_jantarmentar	5000

5 rows in set (0.00 sec)

```
mysql>
```

```
mysql> select customername from DEPOSIT d,ACCOUNTS a
```

```
-> where d.accno=a.accno
```

```
-> group by customername
```

```
-> having count(d.customername) >=2;
```

customername
AVINASH
dinesh
nikhil

3 rows in set (0.00 sec)

```
mysql>
```

```
mysql> select d.customername from DEPOSIT d,BRANCH b,ACCOUNTS a
```

```
-> where b.branch_name=a.branch_name
```

```
-> AND a.accno=d.accno
```

```
-> and branch_city='Delhi'
```

```
-> group by d.customername
```

```
-> HAVING COUNT(distinct b.branch_name)=(
```

```
-> SELECT COUNT(branch_name)
```

```
-> FROM branch
```

```
-> WHERE branch_city='Delhi');
```

```

+-----+
| customername |
+-----+
| nikhil      |
+-----+
1 row in set (0.00 sec)

```

```

mysql>
mysql> delete from ACCOUNTS
      -> where branch_name IN(SELECT branch_name FROM branch WHERE branch_city='Bombay');
Query OK, 2 rows affected (0.11 sec)

```

```

mysql> Select * from ACCOUNTS;

```

```

+-----+-----+-----+
| accno | branch_name | balance |
+-----+-----+-----+
| 1 | SBI_Chamrajpet | 2000 |
| 2 | SBI_Residency road | 5000 |
| 4 | SBI_parlimentroad | 9000 |
| 5 | SBI_jantarmentar | 8000 |
| 8 | SBI_Residency road | 4000 |
| 9 | SBI_parlimentroad | 3000 |
| 10 | SBI_Residency road | 5000 |
| 11 | SBI_jantarmentar | 2000 |
+-----+-----+-----+

```

SUPPLIER DATABASE:-

Consider the following schema:

SUPPLIERS (sid: integer, sname: string, address: string)

PARTS (pid: integer, pname: string, color: string)

CATALOG (sid: integer, pid: integer, cost: real)

The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in SQL:

- i. Find the pnames of parts for which there is some supplier.
- ii. Find the snames of suppliers who supply every part.
- iii. Find the snames of suppliers who supply every red part.
- iv. Find the pnames of parts supplied by Acme Widget Suppliers and by no one else.
- v. Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part).
- vi. For each part, find the sname of the supplier who charges the most for that part.
- vii. Find the sids of suppliers who supply only red parts

```
mysql> create database SUPPLIER;  
Query OK, 1 row affected (0.21 sec)
```

```
mysql> use SUPPLIER;  
Database changed
```

```
mysql> create table SUPPLIERS(sid BIGINT(5) primary key, sname  
-> varchar(20), city varchar(20));  
Query OK, 0 rows affected, 1 warning (0.90 sec)
```

```
mysql> insert into SUPPLIERS values(10001,'Acme Widget','Bangalore');  
Query OK, 1 row affected (0.30 sec)
```

```
mysql> insert into SUPPLIERS values(10002,'Johns ','Kolkata');  
Query OK, 1 row affected (0.25 sec)
```

```
mysql> insert into SUPPLIERS values(10003,'Vimal','Mumbai');  
Query OK, 1 row affected (0.12 sec)
```

```
mysql> insert into SUPPLIERS values(10004,'Reliance ','Delhi');  
Query OK, 1 row affected (0.24 sec)
```

```
mysql> select * from SUPPLIERS;
```

```
+-----+-----+-----+  
| sid  | sname    | city    |  
+-----+-----+-----+  
| 10001 | Acme Widget | Bangalore |  
| 10002 | Johns      | Kolkata   |  
| 10003 | Vimal      | Mumbai    |  
| 10004 | Reliance   | Delhi     |  
+-----+-----+-----+
```

```
4 rows in set (0.00 sec)
```

```
mysql>
```

```
mysql> create table PARTS(pid BIGINT(5) primary key, pname varchar(20),
```

```
-> color varchar(10));
Query OK, 0 rows affected, 1 warning (0.57 sec)
```

```
mysql> insert into PARTS values(20001,'Book','RED');
Query OK, 1 row affected (0.04 sec)
```

```
mysql> insert into PARTS values(20002,'Pen','RED');
Query OK, 1 row affected (0.07 sec)
```

```
mysql> insert into PARTS values(20003,'Pencil','Green');
Query OK, 1 row affected (0.05 sec)
```

```
mysql> insert into PARTS values(20004,'Mobile ','Green');
Query OK, 1 row affected (0.07 sec)
```

```
mysql> insert into PARTS values(20005,'Charger','Black');
Query OK, 1 row affected (0.04 sec)
```

```
mysql> select * from PARTS;
```

```
+-----+-----+-----+
| pid  | pname | color |
+-----+-----+-----+
| 20001 | Book  | RED   |
| 20002 | Pen   | RED   |
| 20003 | Pencil | Green |
| 20004 | Mobile | Green |
| 20005 | Charger | Black |
+-----+-----+-----+
5 rows in set (0.00 sec)
```

```
mysql>
```

```
mysql> create table CATALOG(sid BIGINT(5), pid BIGINT(5), foreign key(sid)
-> references SUPPLIERS(sid), foreign key(pid) references PARTS(pid),
-> cost float(6), primary key(sid, pid));
Query OK, 0 rows affected, 2 warnings (0.90 sec)
```

```
mysql> insert into CATALOG values(10001,20001,10);
Query OK, 1 row affected (0.04 sec)
```

```
mysql> insert into CATALOG values(10001,20002,10);
Query OK, 1 row affected (0.14 sec)
```

```
mysql> insert into CATALOG values(10001,20003,30);
Query OK, 1 row affected (0.11 sec)
```

```
mysql> insert into CATALOG values(10001,20004,10);
Query OK, 1 row affected (0.22 sec)
```

```
mysql> insert into CATALOG values(10001,20005,10);
Query OK, 1 row affected (0.04 sec)
```

```
mysql> insert into CATALOG values(10002,20001,10);
Query OK, 1 row affected (0.16 sec)
```

```
mysql> insert into CATALOG values(10002,20002,20);
Query OK, 1 row affected (0.09 sec)
```

```
mysql> insert into CATALOG values(10003,20003,30);
Query OK, 1 row affected (0.07 sec)
```

```
mysql> insert into CATALOG values(10004,20003,40);
Query OK, 1 row affected (0.04 sec)
```

```
mysql> select * from CATALOG;
```

sid	pid	cost
10001	20001	10
10001	20002	10
10001	20003	30
10001	20004	10
10001	20005	10
10002	20001	10
10002	20002	20
10003	20003	30
10004	20003	40

9 rows in set (0.00 sec)

```
mysql>
mysql> SELECT DISTINCT P.pname
-> FROM Parts P, Catalog C
-> WHERE P.pid = C.pid;
```

pname
Book
Pen
Pencil
Mobile
Charger

5 rows in set (0.00 sec)

```
mysql>
mysql> select S.sname from SUPPLIERS S where not exists (select P.pid from
-> PARTS P where not exists (select C.sid from CATALOG C where C.sid =
-> S.sid and C.pid = P.pid));
```

sname
Acme Widget

1 row in set (0.00 sec)

```
mysql>
mysql> select S.sname from SUPPLIERS S where not exists (select P.pid from
-> PARTS P where P.color = 'Red' and (not exists (select C.sid from
-> CATALOG C where C.sid = S.sid and C.pid = P.pid)));
```

```
+-----+
| sname  |
+-----+
| Acme Widget |
| Johns   |
+-----+
```

2 rows in set (0.00 sec)

```
mysql>
mysql>
mysql> select P.pname from PARTS P, CATALOG C, SUPPLIERS S where P.pid
-> = C.pid and C.sid = S.sid and S.sname = 'Acme Widget' and not exists
-> (select * from CATALOG C1, SUPPLIERS S1 where P.pid = C1.pid and
-> C1.sid = S1.sid and S1.sname <> 'Acme Widget');
```

```
+-----+
| pname  |
+-----+
| Mobile |
| Charger |
+-----+
```

2 rows in set (0.00 sec)

```
mysql>
mysql>
mysql> SELECT DISTINCT C.sid FROM Catalog C
-> WHERE C.cost > ( SELECT AVG (C1.cost)
-> FROM Catalog C1
-> WHERE C1.pid = C.pid );
```

```
+-----+
| sid  |
+-----+
| 10002 |
| 10004 |
+-----+
```

2 rows in set (0.00 sec)

```
mysql>
mysql>
mysql> SELECT P.pid, S.sname
-> FROM Parts P, Suppliers S, Catalog C
-> WHERE C.pid = P.pid
-> AND C.sid = S.sid
-> AND C.cost = (SELECT MAX(C1.cost)
-> FROM Catalog C1
-> WHERE C1.pid = P.pid);
```


pid	sname
20001	Johns
20001	Acme Widget
20002	Johns
20003	Reliance
20004	Acme Widget
20005	Acme Widget

STUDENT-FACULTY DATABASE:-

Consider the following database for student enrolment for course:

STUDENT (snum: integer, sname: string, major: string, level: string, age: integer)

CLASS (name: string, meets at: time, room: string, fid: integer)

ENROLLED (snum: integer, cname: string)

FACULTY (fid: integer, fname: string, deptid: integer)

The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that the student is enrolled in the class. Level is a two character code with 4 different values (example: Junior: JR etc)

Write the following queries in SQL. No duplicates should be printed in any of the answers.

- Find the names of all Juniors (level = JR) who are enrolled in a class taught by
- Find the names of all classes that either meet in room R128 or have five or more Students enrolled.
- Find the names of all students who are enrolled in two classes that meet at the same time.
- Find the names of faculty members who teach in every room in which some class is taught.
- Find the names of faculty members for whom the combined enrolment of the courses that they teach is less than five.
- Find the names of students who are not enrolled in any class.
- For each age value that appears in Students, find the level value that appears most often. For example, if there are more FR level students aged 18 than SR, JR, or SO students aged 18, you should print the pair (18, FR).

```
mysql> CREATE DATABASE student_faculty;
Query OK, 1 row affected (0.15 sec)
```

```
mysql> USE student_faculty;
Database changed
mysql> CREATE TABLE student(
-> snum INT,
-> sname VARCHAR(10),
-> major VARCHAR(2),
-> lvl VARCHAR(2),
-> age INT, primary key(snum));
Query OK, 0 rows affected (0.43 sec)
```

```
mysql>
mysql> CREATE TABLE faculty(
  -> fid INT,fname VARCHAR(20),
  -> deptid INT,
  -> PRIMARY KEY(fid));
Query OK, 0 rows affected (1.15 sec)
```

```
mysql>
mysql> CREATE TABLE class(
  -> cname VARCHAR(20),
  -> metts_at TIMESTAMP,
  -> room VARCHAR(10),
  -> fid INT,
  -> PRIMARY KEY(cname),
  -> FOREIGN KEY(fid) REFERENCES faculty(fid));
Query OK, 0 rows affected (0.47 sec)
```

```
mysql>
mysql> CREATE TABLE enrolled(
  -> snum INT,
  -> cname VARCHAR(20),
  -> PRIMARY KEY(snum,cname),
  -> FOREIGN KEY(snum) REFERENCES student(snum),
  -> FOREIGN KEY(cname) REFERENCES class(cname));
Query OK, 0 rows affected (0.59 sec)
```

```
mysql>
mysql> INSERT INTO STUDENT VALUES(1, 'jhon', 'CS', 'Sr', 19);
Query OK, 1 row affected (0.18 sec)
```

```
mysql> INSERT INTO STUDENT VALUES(2, 'Smith', 'CS', 'Jr', 20);
Query OK, 1 row affected (0.10 sec)
```

```
mysql> INSERT INTO STUDENT VALUES(3 , 'Jacob', 'CV', 'Sr', 20);
Query OK, 1 row affected (0.06 sec)
```

```
mysql> INSERT INTO STUDENT VALUES(4, 'Tom ', 'CS', 'Jr', 20);
Query OK, 1 row affected (0.09 sec)
```

```
mysql> INSERT INTO STUDENT VALUES(5, 'Rahul', 'CS', 'Jr', 20);
Query OK, 1 row affected (0.16 sec)
```

```
mysql> INSERT INTO STUDENT VALUES(6, 'Rita', 'CS', 'Sr', 21);
Query OK, 1 row affected (0.11 sec)
```

```
mysql> select * from STUDENT;
```

```

+-----+-----+-----+-----+-----+
| snum | sname | major | lvl | age |
+-----+-----+-----+-----+
| 1 | jhon | CS | Sr | 19 |
| 2 | Smith | CS | Jr | 20 |
| 3 | Jacob | CV | Sr | 20 |
| 4 | Tom | CS | Jr | 20 |
| 5 | Rahul | CS | Jr | 20 |
| 6 | Rita | CS | Sr | 21 |
+-----+-----+-----+-----+
6 rows in set (0.00 sec)

```

```

mysql>
mysql> INSERT INTO FACULTY VALUES(11, 'Harish', 1000);
Query OK, 1 row affected (0.06 sec)

```

```

mysql> INSERT INTO FACULTY VALUES(12, 'MV', 1000);
Query OK, 1 row affected (0.22 sec)

```

```

mysql> INSERT INTO FACULTY VALUES(13 , 'Mira', 1001);
Query OK, 1 row affected (0.23 sec)

```

```

mysql> INSERT INTO FACULTY VALUES(14, 'Shiva', 1002);
Query OK, 1 row affected (0.11 sec)

```

```

mysql> INSERT INTO FACULTY VALUES(15, 'Nupur', 1000);
Query OK, 1 row affected (0.07 sec)

```

```

mysql> select * from FACULTY;

```

```

+-----+-----+-----+
| fid | fname | deptid |
+-----+-----+-----+
| 11 | Harish | 1000 |
| 12 | MV | 1000 |
| 13 | Mira | 1001 |
| 14 | Shiva | 1002 |
| 15 | Nupur | 1000 |
+-----+-----+-----+
5 rows in set (0.00 sec)

```

```

mysql>
mysql> insert into class values('class1', '12/11/15 10:15:16', 'R1', 14);
Query OK, 1 row affected (0.06 sec)

```

```

mysql> insert into class values('class10', '12/11/15 10:15:16', 'R128', 14);
Query OK, 1 row affected (0.15 sec)

```

```

mysql> insert into class values('class2', '12/11/15 10:15:20', 'R2', 12);
Query OK, 1 row affected (0.06 sec)

```

```

mysql> insert into class values('class3', '12/11/15 10:15:25', 'R3', 11);
Query OK, 1 row affected (0.05 sec)

```

```
mysql> insert into class values('class4', '12/11/15 20:15:20', 'R4', 14);
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into class values('class5', '12/11/15 20:15:20', 'R3', 15);
Query OK, 1 row affected (0.29 sec)
```

```
mysql> insert into class values('class6', '12/11/15 13:20:20', 'R2', 14);
Query OK, 1 row affected (0.08 sec)
```

```
mysql> insert into class values('class7', '12/11/15 10:10:10', 'R3', 14);
Query OK, 1 row affected (0.05 sec)
```

```
mysql> select * from class;
```

cname	metts_at	room	fid
class1	2012-11-15 10:15:16	R1	14
class10	2012-11-15 10:15:16	R128	14
class2	2012-11-15 10:15:20	R2	12
class3	2012-11-15 10:15:25	R3	11
class4	2012-11-15 20:15:20	R4	14
class5	2012-11-15 20:15:20	R3	15
class6	2012-11-15 13:20:20	R2	14
class7	2012-11-15 10:10:10	R3	14

```
8 rows in set (0.00 sec)
```

```
mysql>
```

```
mysql> insert into enrolled values(1, 'class1');
Query OK, 1 row affected (0.05 sec)
```

```
mysql> insert into enrolled values(2, 'class1');
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into enrolled values(3, 'class3');
Query OK, 1 row affected (0.08 sec)
```

```
mysql> insert into enrolled values(4, 'class3');
Query OK, 1 row affected (0.07 sec)
```

```
mysql> insert into enrolled values(5, 'class4');
Query OK, 1 row affected (0.07 sec)
```

```
mysql> insert into enrolled values(1, 'class5');
Query OK, 1 row affected (0.05 sec)
```

```
mysql> insert into enrolled values(2, 'class5');
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into enrolled values(3, 'class5');
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into enrolled values(4, 'class5');
```

Query OK, 1 row affected (0.21 sec)

```
mysql> insert into enrolled values(5, 'class5');
```

Query OK, 1 row affected (0.17 sec)

```
mysql> select * from enrolled;
```

snum	cname
1	class1
2	class1
3	class3
4	class3
5	class4
1	class5
2	class5
3	class5
4	class5
5	class5

10 rows in set (0.00 sec)

```
mysql>
```

```
mysql> SELECT DISTINCT S.Sname
```

```
-> FROM Student S, Class C, Enrolled E, Faculty F
```

```
-> WHERE S.snum = E.snum AND E.cname = C.cname AND C.fid = F.fid AND
```

```
-> F.fname = 'Harish' AND S.lvl = 'Jr';
```

Sname
Tom

1 row in set (0.00 sec)

1 row in set (0.00 sec)

```
mysql>
```

```
mysql> SELECT DISTINCT cname
```

```
-> FROM class
```

```
-> WHERE room='room128'
```

```
-> OR
```

```
-> cname IN (SELECT e.cname FROM enrolled e GROUP BY e.cname HAVING COUNT(*)>=5);
```

cname
class5

1 row in set (0.00 sec)

1 row in set (0.00 sec)

```
mysql>
```

```
mysql>
```

```
mysql> SELECT DISTINCT S.sname
```

```
-> FROM Student S
```

```

-> WHERE S.snum IN (SELECT E1.snum
-> FROM Enrolled E1, Enrolled E2, Class C1, Class C2
-> WHERE E1.snum = E2.snum AND E1.cname <> E2.cname
-> AND E1.cname = C1.cname
-> AND E2.cname = C2.cname AND C1.metts_at = C2.metts_at);

```

```

+-----+
| sname |
+-----+
| Rahul |
+-----+
1 row in set (0.00 sec)

```

```

mysql>
mysql>
mysql> SELECT f.fname,f.fid
-> FROM faculty f
-> WHERE f.fid in ( SELECT fid FROM class
-> GROUP BY fid HAVING COUNT(*)=(SELECT COUNT(DISTINCT room) FROM class) );

```

```

+-----+-----+
| fname | fid |
+-----+-----+
| Shiva | 14 |
+-----+-----+
1 row in set (0.00 sec)

```

```

mysql>
mysql>
mysql> SELECT DISTINCT F.fname
-> FROM Faculty F
-> WHERE 5 > (SELECT COUNT(E.snum)
-> FROM Class C, Enrolled E
-> WHERE C.cname = E.cname
-> AND C.fid = F.fid);

```

```

+-----+
| fname |
+-----+
| Harish |
| MV    |
| Mira  |
| Shiva |
+-----+
4 rows in set (0.00 sec)

```

```

mysql>
mysql>
mysql> SELECT DISTINCT S.sname
-> FROM Student S
-> WHERE S.snum NOT IN (SELECT E.snum
-> FROM Enrolled E );

```

```

+-----+
| sname |
+-----+
| Rita  |
+-----+
1 row in set (0.00 sec)

```

```

mysql>
mysql>
mysql> SELECT S.age, S.lvl
-> FROM STUDENT S
-> GROUP BY S.age, S.lvl
-> HAVING S.lvl IN (SELECT S1.lvl
-> FROM STUDENT S1
-> WHERE S1.age=S.age
-> GROUP BY S1.age, S1.lvl
-> HAVING COUNT(*) >= ALL (SELECT COUNT(*)
-> FROM STUDENT S2
-> WHERE S1.age=S2.age
-> GROUP BY S2.lvl, S2.age))
-> ORDER BY S.age;

```

```

+-----+-----+
| age | lvl |
+-----+-----+
| 19 | Sr  |
| 20 | Jr  |
| 21 | Sr  |
+-----+-----+

```

FLIGHT DATABASE:-

Consider the following database that keeps track of airline flight information:

FLIGHTS (flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: integer)

AIRCRAFT (aid: integer, aname: string, cruisingrange: integer) **CERTIFIED** (eid: integer, aid: integer)

EMPLOYEE (eid: integer, ename: string, salary: integer)

Note that the Employees relation describes pilots and other kinds of employees as well; Every pilot is certified for some aircraft, and only pilots are certified to fly. Write each of the following queries in SQL.

- i. Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80,000.
- ii. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruising range of the aircraft for which she or he is certified.
- iii. Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru to Frankfurt.
- iv. For all aircraft with cruising range over 1000 Kms, find the name of the aircraft and the average salary of all pilots certified for this aircraft.
- v. Find the names of pilots certified for some Boeing aircraft.
- vi. Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.
- vii. A customer wants to travel from Madison to New York with no more than two changes of flight. List the choice of departure times from Madison if the customer wants to arrive in New York by 6 p.m.
- viii. Print the name and salary of every non-pilot whose salary is more than the average salary for pilots.

```
mysql> create database flightdb;  
Query OK, 1 row affected (0.20 sec)
```

```
mysql> use flightdb;  
Database changed
```

```
mysql>  
mysql> create table flights(  
-> flno int,  
-> fromplace varchar(15),  
-> toplace varchar(15),  
-> distance int,  
-> departs datetime,  
-> arrives datetime,  
-> price int,  
-> primary key (flno)  
-> );
```

```
Query OK, 0 rows affected (0.67 sec)
```

```
mysql> desc flights;
```


Field	Type	Null	Key	Default	Extra
flno	int	NO	PRI	NULL	
fromplace	varchar(15)	YES		NULL	
toplace	varchar(15)	YES		NULL	
distance	int	YES		NULL	
departs	datetime	YES		NULL	
arrives	datetime	YES		NULL	
price	int	YES		NULL	

7 rows in set (0.09 sec)

```
mysql> create table aircraft(
-> aid int,
->  aname varchar(15),
->  cruisingrange int,
->  primary key (aid)
-> );
```

Query OK, 0 rows affected (1.19 sec)

```
mysql> desc aircraft;
```

Field	Type	Null	Key	Default	Extra
aid	int	NO	PRI	NULL	
aname	varchar(15)	YES		NULL	
cruisingrange	int	YES		NULL	

3 rows in set (0.00 sec)

```
mysql> create table employees (
-> eid int,
->  ename varchar(15),
->  salary int,
->  primary key (eid)
-> );
```

Query OK, 0 rows affected (0.40 sec)

```
mysql> desc employees;
```

Field	Type	Null	Key	Default	Extra
eid	int	NO	PRI	NULL	
ename	varchar(15)	YES		NULL	
salary	int	YES		NULL	

3 rows in set (0.00 sec)

```
mysql> create table certified (
-> eid int,
->  aid int,
->  foreign key (eid) references employees(eid),
```

```
-> foreign key (aid) references aircraft(aid)
-> );
Query OK, 0 rows affected (0.95 sec)
```

```
mysql> desc certified;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| eid   | int  | YES  | MUL | NULL    |       |
| aid   | int  | YES  | MUL | NULL    |       |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

```
mysql> insert into flights values(101, 'Bangalore', 'Delhi', 2500, '2005-05-13 07:15:31', '2005-05-13
18:15:31', 5000);
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into flights values(102, 'Bangalore', 'Lucknow', 3000, '2013-05-05 07:15:31', '2013-05-05
11:15:31', 6000);
Query OK, 1 row affected (0.13 sec)
```

```
mysql> insert into flights values(103, 'Lucknow', 'Delhi', 500, '2013-05-05 12:15:31', '2013-05-05 17:15:31',
3000);
Query OK, 1 row affected (0.12 sec)
```

```
mysql> insert into flights values(107, 'Bangalore', 'Frankfurt', 8000, '2013-05-05 07:15:31', '2013-05-05
22:15:31', 60000);
Query OK, 1 row affected (0.23 sec)
```

```
mysql> insert into flights values(104, 'Bangalore', 'Frankfurt', 8500, '2013-05-05 07:15:31', '2013-05-05
23:15:31', 75000);
Query OK, 1 row affected (0.08 sec)
```

```
mysql> insert into flights values(105, 'Kolkata', 'Delhi', 3400, '2013-05-05 07:15:31', '2013-05-05 09:15:31',
7000);
Query OK, 1 row affected (0.10 sec)
```

```
mysql> insert into flights values(106, 'Bangalore', 'Kolkata', 1000, '2013-05-05 01:15:30', '2013-05-05
09:20:30', 10000);
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into flights values(108, 'Lucknow', 'Kolkata', 1000, '2013-05-05 11:30:30', '2013-05-05
15:20:30', 10000);
Query OK, 1 row affected (0.13 sec)
```

```
mysql>
mysql> commit;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql>
mysql> select * from flights;
```

```

+-----+-----+-----+-----+-----+-----+-----+
| flno | fromplace | toplace | distance | departs          | arrives          | price |
+-----+-----+-----+-----+-----+-----+-----+
| 101 | Bangalore | Delhi   | 2500 | 2005-05-13 07:15:31 | 2005-05-13 18:15:31 | 5000 |
| 102 | Bangalore | Lucknow | 3000 | 2013-05-05 07:15:31 | 2013-05-05 11:15:31 | 6000 |
| 103 | Lucknow   | Delhi   | 500  | 2013-05-05 12:15:31 | 2013-05-05 17:15:31 | 3000 |
| 104 | Bangalore | Frankfurt | 8500 | 2013-05-05 07:15:31 | 2013-05-05 23:15:31 | 75000 |
| 105 | Kolkata   | Delhi   | 3400 | 2013-05-05 07:15:31 | 2013-05-05 09:15:31 | 7000 |
| 106 | Bangalore | Kolkata | 1000 | 2013-05-05 01:15:30 | 2013-05-05 09:20:30 | 10000 |
| 107 | Bangalore | Frankfurt | 8000 | 2013-05-05 07:15:31 | 2013-05-05 22:15:31 | 60000 |
| 108 | Lucknow   | Kolkata | 1000 | 2013-05-05 11:30:30 | 2013-05-05 15:20:30 | 10000 |
+-----+-----+-----+-----+-----+-----+-----+
8 rows in set (0.00 sec)

```

mysql>

mysql> insert into aircraft values(101, '747', 3000);

Query OK, 1 row affected (0.05 sec)

mysql> insert into aircraft values(102, 'Boeing', 900);

Query OK, 1 row affected (0.06 sec)

mysql> insert into aircraft values(103, '647', 800);

Query OK, 1 row affected (0.07 sec)

mysql> insert into aircraft values(104, 'Dreamliner', 10000);

Query OK, 1 row affected (0.08 sec)

mysql> insert into aircraft values(105, 'Boeing', 3500);

Query OK, 1 row affected (0.22 sec)

mysql> insert into aircraft values(106, '707', 1500);

Query OK, 1 row affected (0.13 sec)

mysql> insert into aircraft values(107, 'Dream', 120000);

Query OK, 1 row affected (0.08 sec)

mysql> insert into aircraft values(108, '707', 760);

Query OK, 1 row affected (0.11 sec)

mysql> insert into aircraft values(109, '747', 1000);

Query OK, 1 row affected (0.05 sec)

mysql> commit;

Query OK, 0 rows affected (0.00 sec)

mysql>

mysql> select * from aircraft;

```

+----+-----+-----+
| aid | aname  | cruisingrange |
+----+-----+-----+
| 101 | 747    | 3000 |
| 102 | Boeing | 900  |
| 103 | 647    | 800  |
| 104 | Dreamliner | 10000 |
| 105 | Boeing | 3500 |
| 106 | 707    | 1500 |
| 107 | Dream  | 120000 |
| 108 | 707    | 760  |
| 109 | 747    | 1000 |
+----+-----+-----+

```

9 rows in set (0.00 sec)

mysql>

mysql> insert into employees values(701, 'A', 50000);
Query OK, 1 row affected (0.08 sec)

mysql> insert into employees values(702, 'B', 100000);
Query OK, 1 row affected (0.23 sec)

mysql> insert into employees values(703, 'C', 150000);
Query OK, 1 row affected (0.24 sec)

mysql> insert into employees values(704, 'D', 90000);
Query OK, 1 row affected (0.18 sec)

mysql> insert into employees values(705, 'E', 40000);
Query OK, 1 row affected (0.05 sec)

mysql> insert into employees values(706, 'F', 60000);
Query OK, 1 row affected (0.08 sec)

mysql> insert into employees values(707, 'G', 90000);
Query OK, 1 row affected (0.05 sec)

mysql> commit;

Query OK, 0 rows affected (0.00 sec)

mysql>

mysql> select * from employees;

```

+----+-----+-----+
| eid | ename | salary |
+----+-----+-----+
| 701 | A     | 50000  |
| 702 | B     | 100000 |
| 703 | C     | 150000 |
| 704 | D     | 90000  |
| 705 | E     | 40000  |
| 706 | F     | 60000  |
| 707 | G     | 90000  |
+----+-----+-----+

```

7 rows in set (0.00 sec)

mysql>

mysql> insert into certified values(701, 101);
Query OK, 1 row affected (0.09 sec)

mysql> insert into certified values(701, 102);
Query OK, 1 row affected (0.16 sec)

mysql> insert into certified values(701, 106);
Query OK, 1 row affected (0.09 sec)

mysql> insert into certified values(701, 105);
Query OK, 1 row affected (0.17 sec)

mysql>

mysql> insert into certified values(702, 104);
Query OK, 1 row affected (0.10 sec)

mysql> insert into certified values(703, 104);
Query OK, 1 row affected (0.22 sec)

mysql> insert into certified values(704, 104);
Query OK, 1 row affected (0.06 sec)

mysql>

mysql> insert into certified values(702, 107);
Query OK, 1 row affected (0.07 sec)

mysql> insert into certified values(703, 107);
Query OK, 1 row affected (0.12 sec)

mysql> insert into certified values(704, 107);
Query OK, 1 row affected (0.06 sec)

mysql>

mysql> insert into certified values(702, 101);
Query OK, 1 row affected (0.07 sec)

mysql> insert into certified values(702, 108);
Query OK, 1 row affected (0.07 sec)

mysql> insert into certified values(701, 109);
Query OK, 1 row affected (0.11 sec)

mysql> commit;

Query OK, 0 rows affected (0.00 sec)

mysql> select * from certified;

```

+-----+-----+
| eid | aid |
+-----+-----+
| 701 | 101 |
| 701 | 102 |
| 701 | 106 |
| 701 | 105 |
| 702 | 104 |
| 703 | 104 |
| 704 | 104 |
| 702 | 107 |
| 703 | 107 |
| 704 | 107 |
| 702 | 101 |
| 702 | 108 |
| 701 | 109 |
+-----+-----+
13 rows in set (0.00 sec)

```

```

mysql>
mysql> -- Query 1
mysql> select distinct a.aname from aircraft a where a.aid in (
-> select c.aid from certified c, employees e where
->   c.eid = e.eid and not exists(
-> select * from employees e1 where e1.eid=e.eid and e1.salary<80000
-> )
-> );

```

```

+-----+-----+
| aname |
+-----+-----+
| 747 |
| Dreamliner |
| Dream |
| 707 |
+-----+-----+
4 rows in set (0.00 sec)

```

```

mysql>
mysql> -- Query 2
mysql> select max(a.cruisingrange), c.eid from certified c, aircraft a where c.aid = a.aid group by c.eid
having count(c.eid)>3;

```

```

+-----+-----+
| max(a.cruisingrange) | eid |
+-----+-----+
| 3500 | 701 |
| 120000 | 702 |
+-----+-----+
2 rows in set (0.00 sec)

```

```

mysql>

```

mysql> -- Query 3

mysql> select ename from employees where salary <(
-> select min(price) from flights where fromplace='Bangalore' and toplace='Frankfurt');

```
+-----+  
| ename |  
+-----+  
| A     |  
| E     |  
+-----+
```

2 rows in set (0.00 sec)

mysql>

mysql> -- Query 4

mysql>

mysql> select avg(e.salary), c.aid from certified c, employees e where c.aid in(
-> select aid from aircraft where cruisingrange>1000) and e.eid = c.aid group by c.aid;

```
+-----+-----+  
| avg(e.salary) | aid |  
+-----+-----+  
| 75000.0000    | 101 |  
| 113333.3333   | 104 |  
| 50000.0000    | 105 |  
| 50000.0000    | 106 |  
| 113333.3333   | 107 |  
+-----+-----+
```

5 rows in set (0.00 sec)

mysql>

mysql> -- Query 5

mysql> select ename from employees where eid in(
-> select eid from certified where aid in(
-> select aid from aircraft where aname = 'Boeing'));

```
+-----+  
| ename |  
+-----+  
| A     |  
+-----+
```

1 row in set (0.00 sec)

mysql>

mysql> -- Query 6

mysql>

mysql> select aname from aircraft where cruisingrange > any (select distance from flights where
fromplace='Bangalore' and toplace='Delhi');

```
+-----+  
| aname |  
+-----+  
| 747    |  
| Dreamliner |  
| Boeing |  
| Dream  |  
+-----+
```

4 rows in set (0.00 sec)

```

mysql>
mysql>
mysql> -- Query 7
mysql> SELECT F.flno, F.departs
-> FROM flights F
-> WHERE F.flno IN ( ( SELECT F0.flno
-> FROM flights F0
-> WHERE F0.fromplace = 'Bangalore' AND F0.toplace = 'Kolkata'
-> AND extract(hour from F0.arrives) < 18 )
-> UNION
-> ( SELECT F0.flno
-> FROM flights F0, flights F1
-> WHERE F0.fromplace = 'Bangalore' AND F0.toplace <> 'Kolkata'
-> AND F0.toplace = F1.fromplace AND F1.toplace = 'Kolkata'
-> AND F1.departs > F0.arrives
-> AND extract(hour from F1.arrives) < 18)
-> UNION
-> ( SELECT F0.flno
-> FROM flights F0, flights F1, flights F2
-> WHERE F0.fromplace = 'Bangalore'
-> AND F0.toplace = F1.fromplace
-> AND F1.toplace = F2.fromplace
-> AND F2.toplace = 'Kolkata'
-> AND F0.toplace <> 'Kolkata'
-> AND F1.toplace <> 'Kolkata'
-> AND F1.departs > F0.arrives
-> AND F2.departs > F1.arrives
-> AND extract(hour from F2.arrives) < 18));

```

```

+-----+-----+
| flno | departs      |
+-----+-----+
| 102 | 2013-05-05 07:15:31 |
| 106 | 2013-05-05 01:15:30 |
+-----+-----+

```